strated that "when a nerve going to a muscle is put upon another muscle, a contraction takes place in the first one when the second contracts." Dr. L. has not, however, by any method of proof whatever, shown the existence of any galvanic current, or its conduction from the heart to the diaphragm; and it seems improbable that the electricity generated in the heart could be conducted in sufficient quantity through such non-conducting media as the pericardium and "oiled paper" as to cause contraction of the diaphragm. It will require more than the mere statement that this is the cause of these movements before this explanation can be accepted as true, especially as it was shown, twenty years ago, that they could occur after destruction of the phrenic nerves, and all the cerebro-spinal centres. R. M. S.

ART. XXXI.—*Eighth Annual Report of the State Board of Health of Massachusetts*, January, 1877. 8vo. pp. 498. Boston, 1877.

TAKING it for granted that our readers expect, as a matter of course, to find this Report a very important contribution to sanitary science, we can assure them that they are not mistaken. Some of the papers are naturally, and most properly, prompted by the peculiar needs and conditions obtaining in Massachusetts. One or two others, possibly, might be criticized as being founded on insufficient, or inadequate premises. The first-named trait, while of course adding decidedly to the domestic value of the Report, by no means so certainly injures its outside usefulness. For the same conditions, the same evils, tendencies, and problems, which now obtain in the Bay State, are likely to present themselves, if not already demanding attention, in the younger and less thickly settled communities. Fortunate, indeed, will these be, if their governing bodies shall have the good sense and the patriotism to avail themselves of the wisdom and experience which these admirable Reports have placed at the disposal of the whole world.

A very few words in the *General Report*, chronicle an achievement, of itself an ample justification for the existence of the Board. The entire business of slaughtering animals for the markets of Boston, a city of 346,000 inhabitants, has been by law concentrated, and confined in the model abattoir planned and constructed under the direction of this Board in Brighton. At its own request, the power of regulating, supervising, and inspecting this abattoir has been transferred from the State to the City Health Board. We trust the municipal authorities may prove faithful and grateful guardians of the solid benefits secured them by the long and hard work of the State Board. For though at present the abattoir has few enemies and many friends, it was not without hard fighting, against legal opposition, reproach, obloquy, outcries of monopoly and oppression, that the beneficent victory was won.

The systematic examination of the water streams of the State, with a view to ascertaining and preventing their pollution, is here continued. Civil Engineer E. K. Clark and Prof. Wm. R. Nichols have carefully studied the basin of the Nashua River, and the character of its waters at different points, in the manner described in our notice of the seventh Report, in the Journal for October last. Founded upon the labours of these gentlemen, Secretary FOLSOM has prepared an article in three divisions, treating of the *Pollution of Streams*, *the Disposal of Sewage*, and *Drainage and Health.* The beneficent agency of natural causes in restoring the purity of running waters when exposed to light and air is clearly apparent in some part of the course of the Nashua. While fully recognizing the desirableness of preserving entire cleanness in all rivers, the writer believes that at present, and probably for many years, they must be the chief channels for the removal of waste matters. In practice, therefore, he would aim rather at inoffensiveness than at absolute purity. In other words, we should not always expect to make river water in a thickly settled community perfectly safe and wholesome as a beverage, but sometimes be satisfied if its presence and use in other ways be free from harm and annoyance. Whatever may be the case in after years, or now in exceptional places, the natural water-courses of the State must long continue to be the principal carriers of sewage. Regulation and limitation of pollution seem then, in many cases, more profitable than attempts at entire prevention.

The latest experiences in various places, upon the disposal of sewage, are briefly reviewed. It is pretty evident that of the many devices to replace water carriage, Dr. Folsom looks with little hope upon any except irrigation. The availability of this on a large scale, and in all circumstances, is yet to be demonstrated. This system itself, indeed, is rather a modification than a substitute for water carriage. An extremely interesting experiment upon sewage irrigation has been in progress for some years in a suburb of Paris. Little by little the amount of sewage thus used is increasing. With each year, too, the method gains in popularity with both citizens and agriculturalists. As new applicants appear for the irrigation, additional conduits are extended out into the country. The growth of the system is, therefore, a purely natural one. No insanitary results have followed this experiment.

Some of the most striking instances of disease from water contamination which have become known since his last Report are cited by Dr. Folsom as fresh instances of evils flowing from bad or neglected drainage. Practical suggestions as to the connections of house drains with city sewers, and as to the urgent need of a careful inspection of these arrangements in all new houses, are well worth attention.

Mr. E. S. CHESBROUGH, City Engineer of Chicago, has prepared for the Board a thoroughly practical paper upon *Sewerage; Its Advantages and Disadvantages; Construction and Maintenance.* When we read his wise counsels as to how such work should be done, we can only sigh as we think of our own much suffering community, and wonder if ever again wisdom, honesty, and economy shall exist in connection with municipal constructions. If there be any town really desirous to obtain good sewerage, from good motives, the authorities cannot do better than to begin by a careful reading of this essay.

A paper upon the *Sanitary Condition of Lynn*, by J. G. PINKHAM, M.D., affords an example of a kind of investigation which the Board hopes will be made in many other towns. The idea is to obtain a complete sanitary survey of the place, taking into account local peculiarities, of soil, sub-soil, water, climate, and other natural traits, together with such influences as flow from the character, occupation, and habits of its population. It is a first step towards a truly scientific attack upon the death-rate; a reconnoissance by which the active campaign may be directed. The survey given is a very full and complete one. It points out with great clearness many sources of insanitary influences, and indicates methods of relief. The examination includes the nativity and descent of the population; the mortality as affected by race and age; the prevailing diseases; and the comparative healthfulness of different districts. A large map of the city exhibits the deaths from prominent causes, in connection with the height above high water, and above the clay strata underlying the place.

Among the interesting points brought out by this survey, are the active agency of contaminated well water, and the nearness of the clay to the surface, as affecting local prevalence of disease. As illustrating morbific influences of another kind, the general existence of womb complaints among the factory girls is noted as due to their work.

In a paper on *Registration of Deaths and Diseases*, Dr. FOLSOM gives the results derived from circular letters of inquiry sent to physicians and to town-clerks throughout the State. The aim was to discover how exact and trustworthy the death-returns as reported really are. Obviously, the information received was not very agreeable or encouraging. Defects in the law, its non-enforcement, and the incompetency of many persons signing death certificates, are some of the more obvious reasons for existing imperfections and blunders. Among alleged causes of death were noted the following: "Five doctors," "collocinphanton," "billirm fever," "direars," and "artry lung bursted."

Unless we misinterpret some words concerning the registration of prevalent diseases, the attempt in this direction made by the Board during 1875 has not been kept up. Apparently the returns from physicians were too sparse and too irregular to give valuable results.

A very curious and interesting paper upon the *Growth of Children* is contributed by Dr. H. P. BOWDITCH, Professor of Physiology in the Harvard Medical School. The article may be advantageously compared with the statistics of the Provost-Marshal-General's Bureau, noticed in this Journal for October, 1876. The immediate object of the observations here tabulated was the ascertaining of "the rate of growth of the human race under the conditions which Boston presents." Nearly twenty-five thousand pupils of the public and private schools of Boston have been carefully weighed and measured, and the facts classified so as to exhibit the relations of sex, age, parentage, etc. Many very interesting comparisons are displayed, not by figures alone, but by charts where the parallelism or divergence of lines represents very forcibly the agreement or diversity of the vital phenomena. Our readers will, of course, understand that the yearly rate of increase in height or weight for each and every class of children is estimated not from successive measurements of the same individuals, but from simultaneous examination of children of different ages in each category. Not only are the Boston school children compared with each other, but also with some classes of youth in the Old World. To eliminate from the inquiry any possible influence of insufficient food, or insanitary conditions, pupils from the wealthier classes in England are brought into comparison with scholars from a corresponding sphere in this country.

The last-named comparison fully confirms the results reached by Surgeon Baxter in the Report from the Provost-Marshal-General's Bureau, as to the gravity of Americans. For Dr. Baxter's conclusion as to our adult population is supported by Dr. Bowditch's measurements of our children; neither old nor young are gaunt or slender for their height, when contrasted with their British brethren. The Boston measurements do show, however, a slight excess in weight of children of German parentage over American children of the same height. Age for age, however, the natives are the heavier. Inadequate nutriment and unwholesome surroundings would seem, judging from European observations, to diminish stature more than weight, though both are affected in a growing child. Between American and English children of the comfortable classes, the excess of both height and weight is with the former.

The relation of sex to growth presents some facts of great importance. At the age of thirteen or fourteen years the girls in the Boston schools are both taller and heavier than the boys. Before and after this age the relation is reversed. Hence it is manifest that at a period just prior to the epoch named, physical development must be more rapid in the girl than in the boy. Even if the special evolutions attendant on puberty be left out of account, it would seem that this disproportionate increase of bone and muscle should point to a difference in the mental labours expected from the two sexes.

Up to the height of fifty-eight inches, attained at about the age of fourteen years, the boy is proportionately heavier than the girl. Above that point the reverse relation obtains.

Inferences as to the effects of race or of change in climatic conditions cannot very safely be made, from the inferior size of children of Irish descent, as observed in the Boston schools, because of the disturbing influence likely to be exerted by the differing wealth and comfort of the two classes. It seems probable, however, that the superior weight and height of the American pupils is due to the conjoint action of ethnological causes and favourable surroundings.

Some suggestions are appended to this paper to show in what directions researches of this character may be most usefully extended. The effects of geographic and climatic conditions upon the growth of children; the number of generations required to alter the physical traits of descendants from foreign immigrants; the influence of seasons; the comparative influence of city or country life upon development; the effect of diseases upon subsequent growth; the agency of various local sanitary or insanitary conditions in modifying the progress towards maturity: these subjects properly investigated would surely have most important bearings upon national health and prosperity. Dr. Bowditch well suggests that "in the future the hygienist and the educator will recognize, in the physical measurements of growing children, a guide for the application of their sanitary regulations, and a test for the efficiency of their systems of physical training."

The number and variety of tables appended to this article present the observed facts in almost every conceivable relation. Embodying, as the principal ones do, observations upon some twenty-five thousand school children, they furnish a basis broad enough for very important generalizations. Understanding of the facts is also greatly assisted by numerous charts, in which different classes of data are represented by distinctive lines whose relative position and degree of parallelism or divergence exhibit relations more strikingly than do the columns of figures. Unless we are much mistaken this paper will be universally recognized as an extremely valuable contribution to anthropology and to public medicine.

The usual report upon the *Health of Towns*, based upon information received from correspondents, deals more especially this year with diphtheria. Three cities of from 25,000 to 50,000 inhabitants experienced during 1876 very serious epidemics of this disease. Special reports with tables and maps are presented from these places. Lynn had some six hundred cases in a population of thirty-three thousand. The fatality here was about twenty per cent. Soil moisture seemed to invite the disease. Damp weather could not be seen to increase its prevalence. Filthy surroundings were discovered in nearly all cases.

In Salem, slightly less populous, about as many cases are reported, but with a mortality of but twelve per cent. The reporter believes, however, that almost as many more cases of sickness failed to be recorded. The influence of local causes, natural or artificial, in promoting the epidemic, is here much less accounted. While not denying such influence, the writer lays little stress upon it.

In Lowell, the epidemic is characterized as the most fatal ever known. With a population of fifty thousand, the *mortality* from diphtheria is reckoned to be over two hundred, from a probable total of a thousand or twelve hundred cases. Moisture of soil, poor sewerage, and filth are by this reporter assigned a very prominent causative agency.

In the State at large the disease does not seem to have especially prevailed. Its moderate contagiousness seems everywhere recognized. Filth and wet soil are usually named as very favourable to its prevalence.

A very important essay by Secretary Folsom, upon *Diseases of the Mind*, has been republished in pamphlet form, and will be found noticed on another page.

B. L. R.